

# An unexpectedly therapeutic ultrasound: Real-time capture of ovarian cyst rupture

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## Abstract

Simple ovarian cysts and cyst accidents are common gynaecological presentations in pre-menopausal women. In this case report, a cyst rupture occurred during ultrasound scan, neatly uniting the pre-and-post accident appearances in one event.

The patient attended with pain and a 6-centimetre cyst seen on CT, for ultrasound evaluation and follow up by gynaecology as a day attender. At ultrasound scan the left ovarian cyst was immediately evident, but rapidly ruptured, devolved and disappeared, leaving only a normal left ovary and some surrounding free liquid. Time-stamped images show the evolution from tense cyst through regressing cyst walls and finally the post-rupture outcome, all within a few minutes. They also allow us to compare the volume of the cyst (100mL) with the volume of evident free liquid post rupture (20mL) as a learning point for suspecting recent cyst rupture at otherwise normal pelvic ultrasound.

Although the presentation and the regression of the cyst are commonplace occurrences, it is highly unusual to capture this event in real-time ultrasound scanning. This case report may therefore be of interest to those who are involved with ultrasound in gynaecology.

## Keywords

Simple ovarian cyst, cyst rupture

## Ethics

Permission has been granted by the patient and the institution to present this work. There are no relevant financial disclosures

## Background

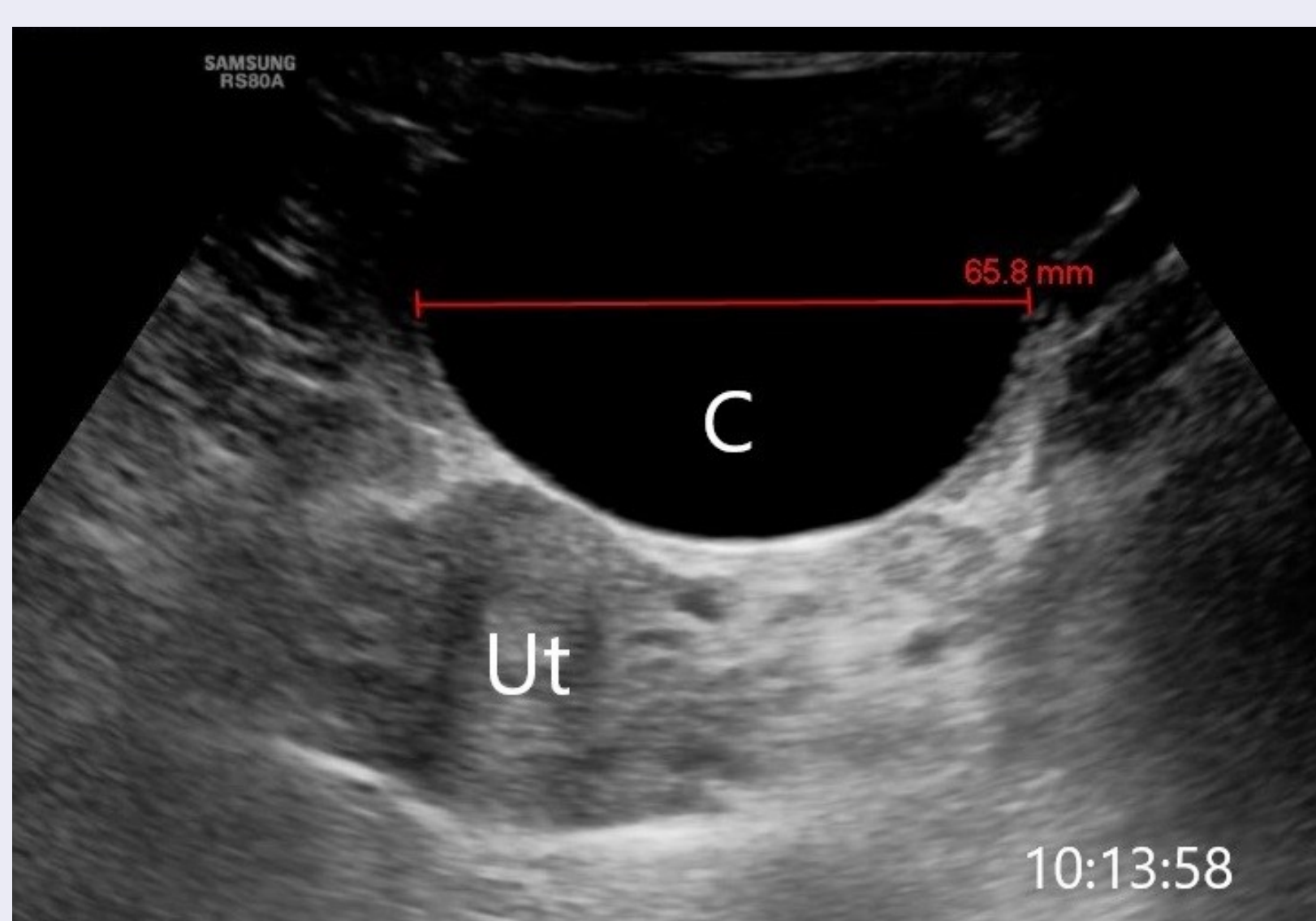
Simple ovarian cysts are a highly prevalent gynaecological condition with prevalence of between 12% (Pavlik et al., 2013) and 24% (Liau and Schultz, 2020) in pre-menopausal women. They are increasingly detected incidentally in asymptomatic women during diagnostic tests for other conditions (Christensen, Boldsen, and Westergaard, 2002). Most of these cysts under 5cm in diameter will resolve in a few menstrual cycles, while simple cysts from 5cm to 7cm in size merit follow up (McNamara and Brook, 2018). The proportion of simple cysts resolving spontaneously falls with increasing size of cyst and age of patient (Zanetta et al., 1996).

The risk of malignancy of simple cysts is very low (Levine et al., 2019), but they can present with clinical symptoms, especially pain, due to size, rupture, or torsion (Zucchini and Marra, 2014). Scan requests for “? ovarian cyst” or “?cyst accident” are common indications for ultrasound scan, either from primary or emergent care.

## Case Presentation

A 32 year old female with history of recent cystocele repair presented at Accident and Emergency with ongoing low abdominal pain. A contrast enhanced abdomen/pelvis CT scan showed normal findings apart from a 6cm left ovarian cyst; ultrasound was therefore recommended.

Figure 1: Transabdominal scan transverse view



All images are annotated with the time stamps showing when each image was sent to the PACS. All annotations are Ut = Uterus, C= Cyst, FF = Free Fluid

Figure 2: Transabdominal oblique view

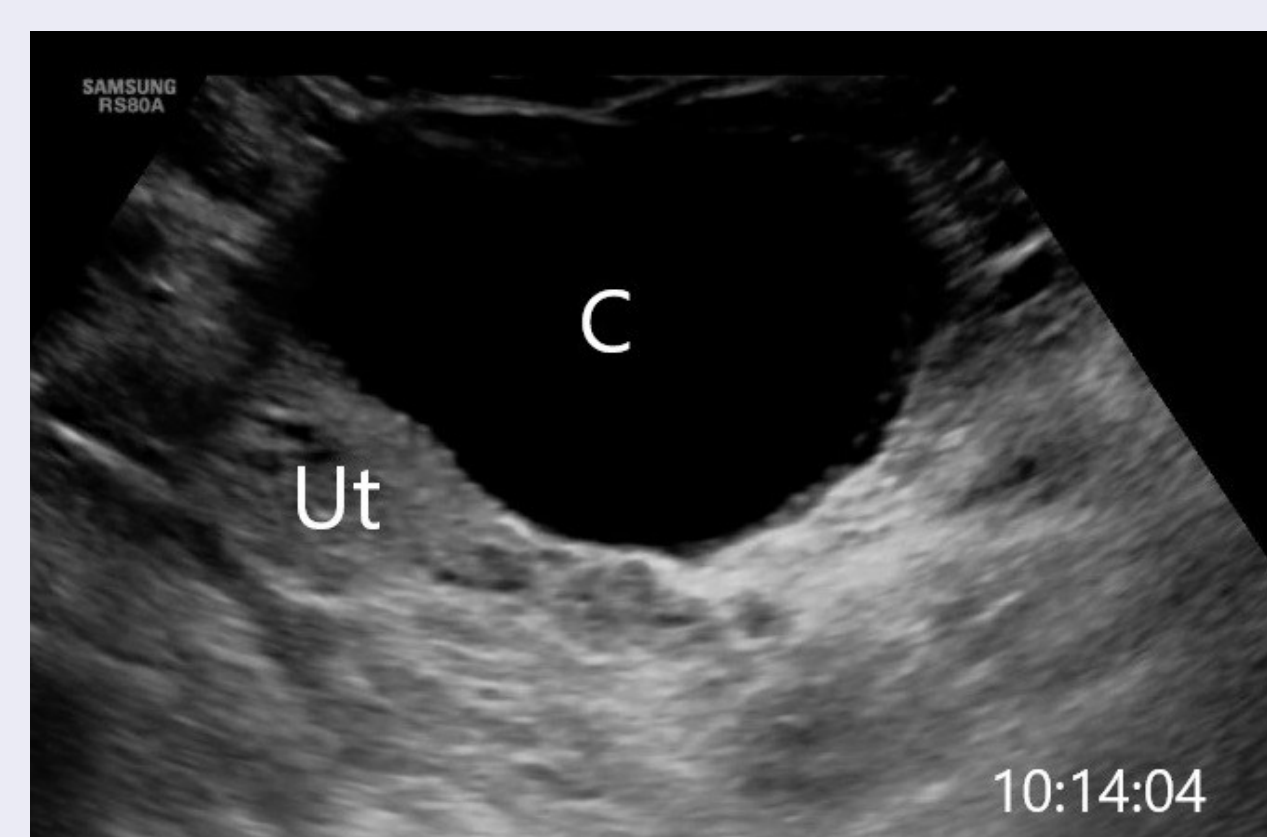


Figure 3: Transabdominal transverse view

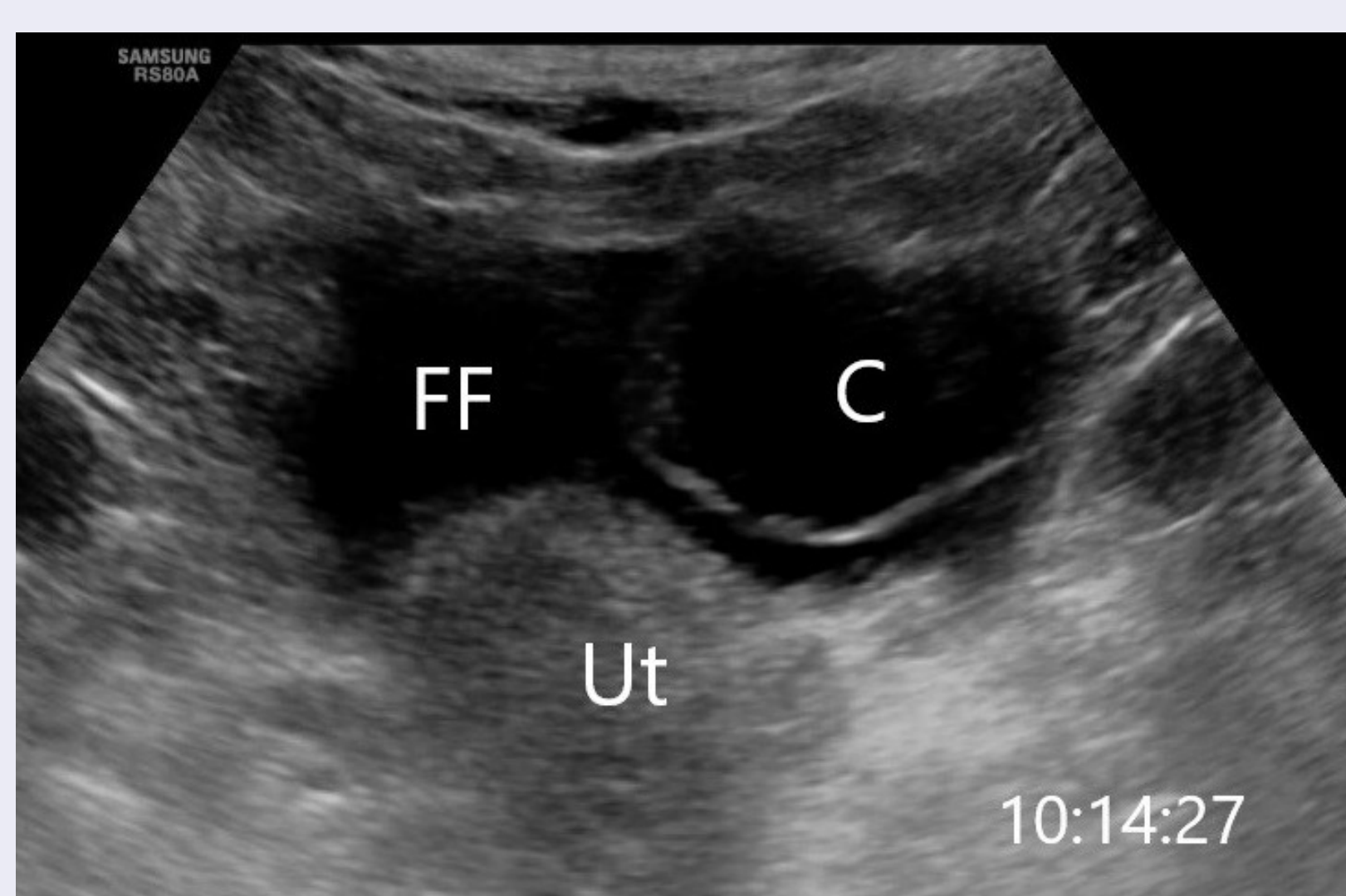


Figure 4: Transabdominal transverse view

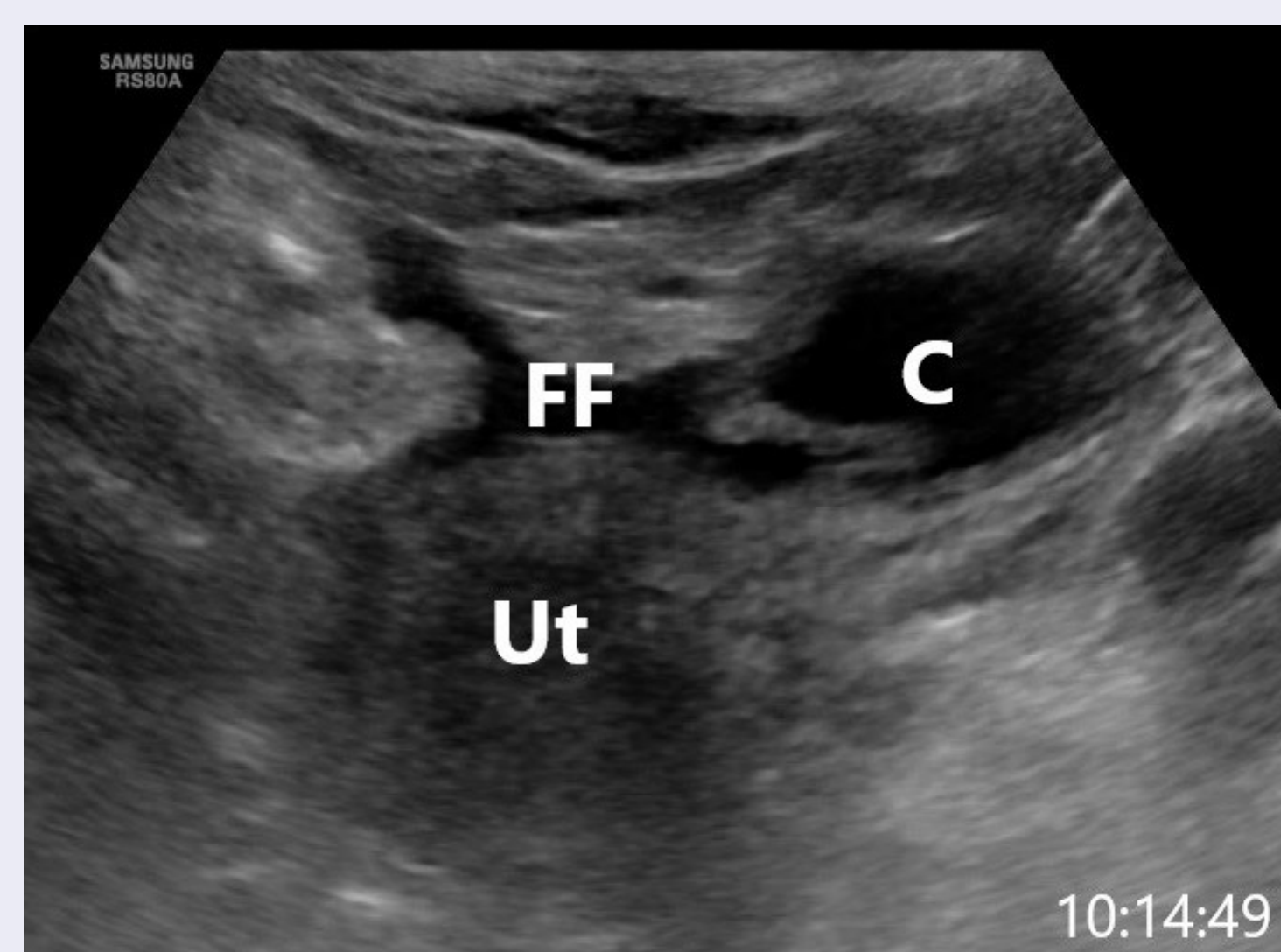


Figure 5: Transabdominal left ovary with surrounding traces of free fluid

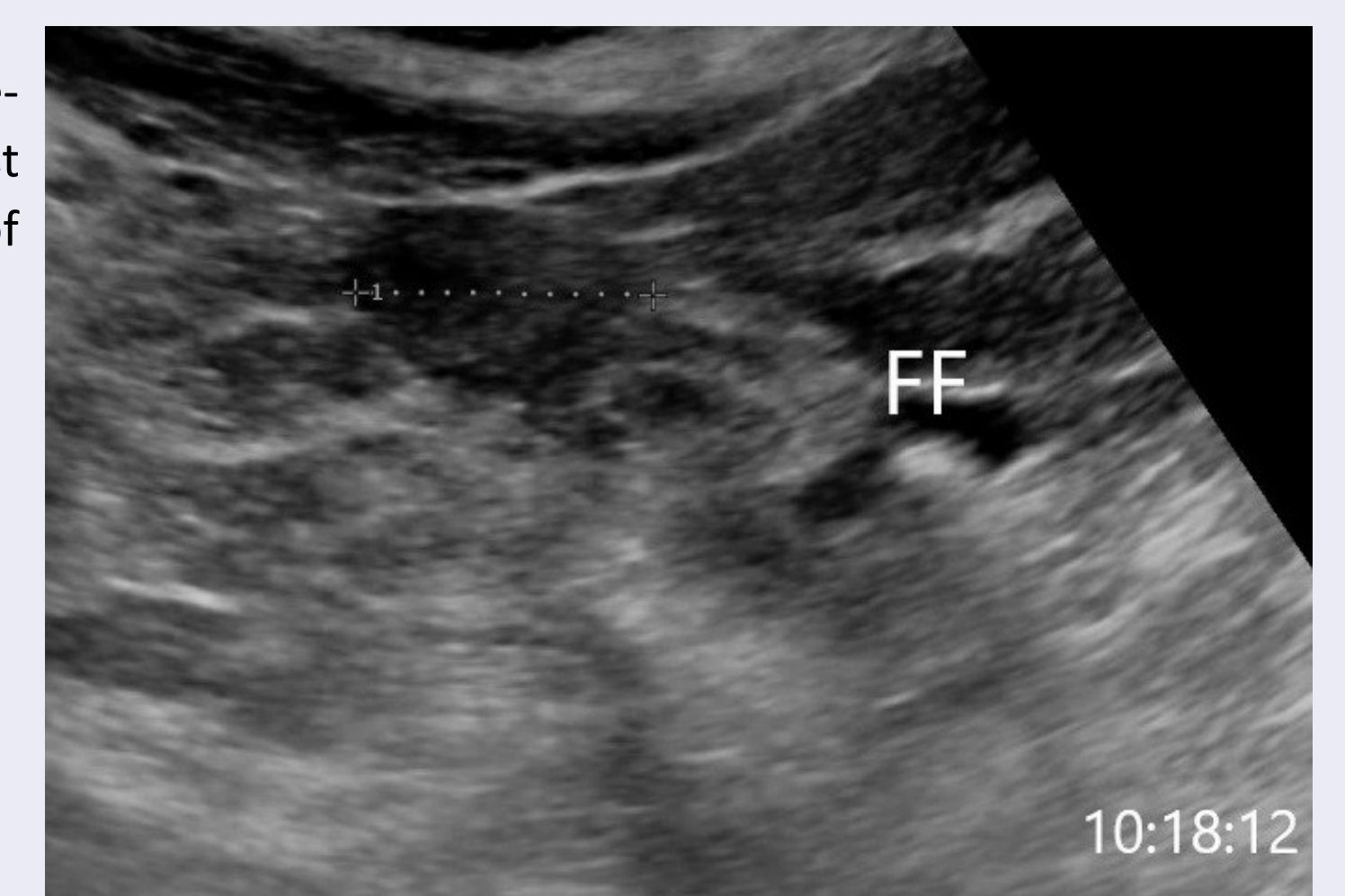
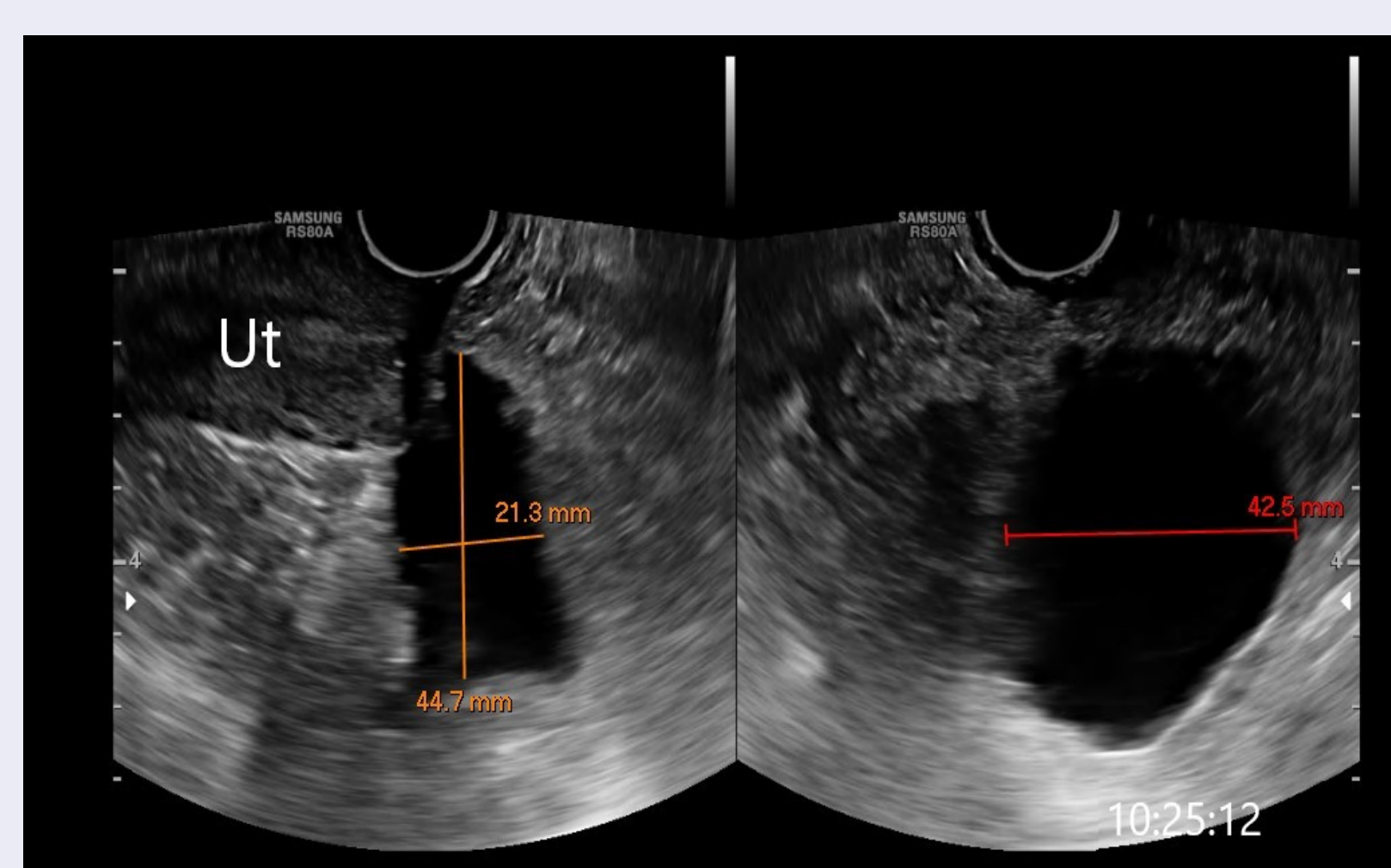


Figure 6: Transvaginal scan showing 20cc of free fluid in the Pouch of Douglas



FF 4.5 x 2.2 x 4.3 x .523 = 21cm<sup>3</sup>

Post hoc measurements of the cyst from trans-abdominal images give estimated cyst volume:

C 6.6x 5.7 x 5.1 x .523 = 100cm<sup>3</sup>

In the limited number of images taken prior to cyst rupture, no free pelvic liquid was visualised.

Most of the cyst contents are therefore assumed to be well -distributed after rupture and no longer visible at scan.

## Discussion:

This case shows the evolution of a very common scan finding, as cysts and resulting cyst accidents are common causes of pelvic pain.

The main finding of interest is the visualisation over time of the cyst rupture. The cyst went from obvious to completely invisible on scan within a minute, leaving only traces of distributed free pelvic liquid.

The amount of free pelvic liquid at the end of scan (21cc) is about twice as much as normal physiological amount allowed (10cc), but only one fifth of the estimated cyst contents (100cc). Without any history of cyst this free liquid would be a non-specific finding. This case gives some evidence that a moderate quantity of free pelvic liquid can be related to recent cyst rupture, but interpretation would depend on history and clinical findings.

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